tics of emigration were vitiated by the omission of any deduction in respect of the return of persons temporarily leaving the country; and he induced the Government to appoint a committee to consider the whole question of official statistics.

In 1878 he read before the Statistical Society an important paper on recent accumulations of capital in the United Kingdom, which is an excellent example of the comprehensiveness and accuracy of his statistical methods, and of his faculty of drawing trustworthy inferences from materials that at first sight appear insufficient. Great as was the increase of wealth which he had to record, he was sanguine enough to hold that it would be the fault of the English people if their progress were not in future even more rapid than in the past, and his forecast has been verified. In the same year he took part in the foundation of the *Statist* newspaper, and was the delegate of the Government to the International Statistical Congress at Paris.

In 1879 he contributed to the Statistical Society a treatise on the fall of prices of commodities in recent years, and undertook the duty of editor of the society's journal. The Treasury committee on statistics made its report, to which was appended an important memorandum by Sir Robert Giffen on the compilation and printing of the statistics of the United Kingdom. In 1882 he read a paper to the Statistical Society on the use of import and export statistics, and was elected president of the society. His inaugural address was on the utility of common statistics. In the following year the University of Glasgow, of which he had been a student, conferred upon him the degree of Doctor of Laws. His inaugural address to the Statistical Society for that year was on the progress of the working classes in the last half-century. It is characteristic of his thorough devotion to any duty which he undertook that he was present at every meeting of the society held during his presidency. In the year 1884 he was elected a member of the Athenæum club under the rule which enables the committee of the club to confer that honour on persons distinguished in literature or the arts or for public service. In 1885 he contributed to the Statistical Society's jubilee volume a paper on some general uses of statistical knowledge; and, in the following year, read to the society further notes on the progress of the working classes. In 1887 he was nominated by the International Statistical Congress at Rome as the English member of a committee on standards of value; and in the same year he was appointed by the British Association president of the section of economic science and statistics (section F) for the meeting at Manchester, and delivered an address on the recent rate of material progress in England. He also took part in the proceedings of a committee of the association appointed to investigate variations in the value of the monetary standard, and in the following year drew up the report of that committee. He afterwards became its chairman.

In 1890 Sir Robert Giffen took part in the formation of the British Economic Association, now the Royal Economic Society, and became a vice-president of it. In 1891 he was created a Companion of the Bath, and in 1892 elected a Fellow of the Royal Society. In 1894 the Royal Statistical Society (as it had then become) paid him the well-earned compliment of awarding him their Guy medal in gold as a recognition of his great services. In 1895 he took the second step in the ladder of the Order of the Bath, being promoted to the dignity of Knight Commander, and in 1897 he retired from the public service after a career of great usefulness and distinction, having taken a large share in the creation and development of the labour, commerciel and statistical departments, of which he was the first controller-general. In 1900 he was elected president of the Manchester Statistical Society, and delivered an address; and in 1901 the British Association appointed him, for the second time, president of section F, and he delivered an address at Glasgow on the importance of general statistical ideas.

His separate published works were:—"American Railways as Investments" (1872), "Stock Exchange Securities" (1877), "Essays in Finance" (3 editions), "The Case against Bimetallism" (2 editions), "Economic Inquiries and Studies" (2 vols., 1904).

This formal record of a life spent in the study of subjects usually thought to be dry and uninteresting would not be complete if it were not supplemented by the statement that in personal character and private life he was one of the most genial of men.

NOTES.

THE eighteenth "James Forrest" lecture of the Institution of Civil Engineers will be delivered at the institution on Wednesday, June 22, at 8 p.m., by Sir John Gavey, C.B., his subject being "Recent Developments of Telegraphy and Telephony.

A REUTER message from Washington states that the proposed American Antarctic expedition under the joint auspices of the Peary Arctic Club and the National Geographic Society has been abandoned for this year on account of lack of funds.

WE learn from *Science* that Prof. R. P. Whitfield, curator in the American Museum of Natural History since 1877, and the author of important contributions to palæontology and geology, died on April 6, at the age of eighty-two years.

THE death is announced, at sixty-one years of age, of Dr. C. B. Plowright, formerly professor of comparative anatomy and physiology at the Royal College of Surgeons, and the author of a standard work on fungi.

M. DE MONTEFIORE, we learn from the *Revue scientifique*, has given 150,000 francs to the Paris Academy of Sciences to create a new triennial prize of 12,500 francs to assist the progress of electrical science.

IT is announced in the *Times* that a National College of Agriculture is soon to be established in Pretoria. General Botha has promised to set aside 100,000*l.* as a first instalment for the execution of the project, and the Town Council has unanimously decided to give the Government the whole of the town lands of Groenkloof as a site. The area comprises 3681 acres, and contains arable and pasture lands as well as a large plantation.

THE Geological Society of France has this year awarded its Danton prize to M. Gosselet. The prize is given to the geologist whose discoveries are likely to benefit industry most, and was awarded to M. Gosselet for the part he has taken in the development of coal-mining in the north of France. The Viquesnel prize, intended to encourage geological research, has been awarded to M. Robert Douvillé for his stratigraphical work on the geology of Spain and his palæontological researches on the foraminifera and ammonites.

THE Geologists' Association has arranged a Whitsuntide excursion to Swanage, Lulworth Cove, and Bournemouth from May 14–18. The party will leave Waterloo on Friday, May 13, at 4.10 p.m. The excursion to Lulworth Cove will be carried out only if the sea is calm, and

should May 14 not be suitable for the excursion, the Lulworth visit will be postponed to May 18. Full particulars of the excursions can be obtained from Mr. W. P. D. Stebbing, 78A Lexham Gardens, London, W.

AN event of importance in wireless telegraphy is the inauguration by the Marconi Company of a service for the direct transmission of public messages between their stations at Clifden, in Ireland, and Glace Bay, in Canada. Both the stations have been recently reconstructed, and communication will be kept up by them continuously both by day and by night. The latter fact is interesting as showing that the difficulties of transmission during the hours of daylight have been overcome. The system is a directive one, the aërials being so constructed as to emit waves principally in the required direction. The discharger used is of the type invented by Mr. Marconi, in which sparking takes place between metal discs cooled by being kept in rapid rotation. By causing the sparks to be formed between equally spaced projections on the discs, the trains of waves emitted are broken up in a regular manner so as to produce in the receiving telephone a musical note which can be clearly distinguished by the operator. The power used for sending is about 400 kilowatts. The service commenced on April 23 by an interchange of greetings between the Postmasters-General of Canada and Great Britain.

THE present spring is proving peculiarly free from spells of really warm weather, and the summary of temperature issued by the Meteorological Office with its Weekly Weather Report shows that for the period of seven weeks ended April 23 the thermometer in the screen did not exceed 64° in any part of the United Kingdom, the highest readings ranging between 60° and 64°. At Greenwich there have, as yet, only been six days this year with a temperature of 60° or above, whilst to the same date last year there were eighteen days with a temperature of 60° or above. The rainfall for the first half of spring is less than the average in all districts, except in the north and east of Scotland and in the south-east of England, the greatest deficiency being 1·08 inches, in the south-west of England. Since the commencement of the year, however, the rainfall is everywhere in excess of the average, and in seven out of twelve districts the excess is more than 2 inches. The mean sea temperature round the British Islands is at present nearly everywhere colder than at the corresponding period last year, and at Kirkwall it is nearly 5° colder.

THANKS to the energy of Mr. C. E. Fagan, and the generosity of owners, a remarkably fine and representative series of trophies illustrating the big game of the Empire has been brought together and dispatched to Vienna for the forthcoming Sports Exhibition. The specimens lent by the Prince of Wales include the record head of the Javan rusa from Mauritius (where the species has been reduced), together with heads of tahr, markhor, musk-ox, and Newfoundland caribou. The Duke of Westminster is sending a magnificent Irish elk skull; Lord Burton an unrivalled twenty-pointer Scots stag; Lord Lamington a pair of Indian lion skins; Captain Collins, of the Wau Garrison, a head of a bull Sudani eland (one of three or four in this country), and Mr. F. C. Selous one of the last really fine heads of the typical South African white rhinoceros.

FOR the purpose of publishing the practical and scientific results obtained through the medium of the Entomological Research Committee (Tropical Africa), it is proposed to issue a journal, to be called *The Bulletin of Entomological Research*. The journal will contain accounts of the observations which have any bearing on the subject of economic entomology; descriptions of insect life-histories, with figures of their earlier stages; reports on practical methods for destroying or keeping in check any noxious species; papers by specialists dealing with the systematic classification of such groups as are known to be, or are likely to be, injurious to human beings, live-stock, or agriculture; and so forth. It is proposed to issue not fewer than four parts annually, and additional parts will be published whenever sufficient material is forthcoming. Further particulars may be obtained from the scientific secretary, Entomological Research Committee, British Museum (Natural History), Cromwell Road, London, S.W.

THE report of the council and the proceedings of the Hampstead Scientific Society for the year 1909 show that the society has completed ten years of useful work. During the year with which the report deals, an astronomical observatory and meteorological station have been established on the top of Hampstead Hill. The Metropolitan Water Board allows the use for the purposes of the observatory and station of a portion of the surface of the covered reservoir near the Whitestone Pond. Arrangements have been made for the meteorological records to be taken twice daily, and the results are published in the monthly return of the Meteorological Office and in the *Hampstead and Highgate Express*. We notice that Sir Samuel Wilks, Bart., F.R.S., has been compelled, through advancing years, to resign the presidentship of the society, and has been succeeded by Prof. W. M. Flinders Petrie, F.R.S. The membership of the society now numbers 274.

DR. JULIUS KÜHN, professor of agriculture at the University of Halle, whose death was announced in these columns last week, was one of the band of workers who laid the foundations for the modern development of the scientific side of agriculture. He acquired a great practical knowledge of the subject in his early days when working as a farmer and, after his student days at Bonn were over, as manager of a large estate. This knowledge proved invaluable when, later on, he was appointed to Halle and devoted himself to the more scientific aspects of his subject. Perhaps his best known work is that in connection with the feeding of animals. It had for many years been customary to compare animal foods with one another in terms of "hay equivalents." The method was necessarily rough, and capable only of limited development. In 1859 Grouven introduced feeding standards based on the amounts of the various food constituents—protein, carbohydrate, &c.—required by the animal; knowing these data and the percentage composition of the foods, it was possible to make up rations suited to the different classes of stock. So attractive was this new view that a tendency arose to regard the feeding of animals as a merely arithmetical problem requiring only a knowledge of the standards and of the composition of foods. Kühn, however, insisted on the necessity of keeping the new work down to the solid ground of fact. Whilst recognising the value and importance of the standards, he also recognised the individuality of the animal and of the crops on which it feeds. His book "Die zweckmässigste Ernährung des Rindviehes," which appeared in 1861, and went through ten editions in the course of thirty years, thus had a steadying effect on the development of the subject. He also published a number of papers on the parasitic diseases of plants, and is remarkable for his early advocacy of the view that sugar-beet "sickness" is the result of nematodes, which can be destroyed by burning over the ground. His activity

was great, and he continued publishing some of his manurial results even after the celebration of his eightieth birthday on October 23, 1905.

IN *Revue des Idées* for March M. L. Bréhier, under the title of "Les Origines de l'Art musalman," discussing the recent investigations of MM. H. Saladin and G. Migeon, shows that Mohammedan art is not the result of a "sudden improvisation." It is due to the development by conquered races, Copts, Syrians, people of Mesopotamia, and Greeks, of ideas surviving from the Chaldæan-Assyrian periods, and, particularly in its repulsion against delineation of the human form, was a protest against Hellenism.

MUCH work has of late been done on the action of various organic arsenic compounds as trypanocides. Drs. R. P. Campbell and J. L. Todd find that arseno-phenylglycin is a more active trypanocide than atoxyl in the treatment of experimental infections of white rats by the *Trypanosoma brucei* (*Montreal Med. Journ.*, xxxviii., 1909, p. 795).

IN the Journal of the Royal Army Medical Corps for August, 1909, Mr. P. D. Strachan and Lieut.-Colonel C. Birt summarise observations on the occurrence of Malta fever in South Africa. The disease has been met with in Orange River Colony, in Hanover, Beaufort West, Kimberley, and Steytlerville, Cape Colony, and in Bechuanaland, and there is a widespread epizootic of Malta fever among the goats of South Africa.

THE *Philippine Journal of Science* for October last (iv., No. 5), which has only recently come to hand, contains matter of considerable medical interest. An attempt to extend the cutaneous reaction, which has been much used in tuberculosis, to leprosy, is reported by F. Calderon and V. G. Heiser. Fifty lepers were vaccinated with a glycerin extract made from excised leprous nodules. In two or three cases there was a doubtful reaction, but otherwise the vaccinations were in all respects like controls done with a glycerin extract of skin from a cholera patient. The filtration of immune sera (anti-tetanic and anti-diphtheritic sera) is the subject of a paper by E. H. Ruediger. The serum was passed through Berkefeld filters, and the filtrate was found to be just as active as the unfiltered serum.

THE issue of the *Philippine Journal of Science* for November, 1909, vol. iv., No. 6, is entirely devoted to systematic zoology, Mr. A. Seale describing a large number of species of fishes as new, while Mr. C. S. Banks names four new Culicidæ and commences a list of the Rhynchota of Palawan, and Mr. L. Griffin communicates a synopsis of the snakes of the same island.

THE April number of the *Journal of Conchology* contains Colonel Godwin-Austen's presidential address to the annual meeting of the Conchological Society in October last, in which emphasis is laid on the importance of a study of the soft-parts of land molluscs as the only means of determining the affinities of the various forms. Some interesting lines of evolution which have been worked out by these means in the Zonitidæ are quoted.

IN the *Entomologists' Monthly Magazine* for June, 1909, Mr. E. A. Newbery adduces evidence to show that the scolytid beetle described in 1834 by Westwood as *Hypothenemus eruditus*, on the evidence of specimens in an old book-cover, and since then generally included in the British list, is really an exotic species, one of the habitats of which is the shells of Brazil nuts, while it has also been observed in book-covers from Java and Singapore. It had previously been recorded from tropical America in the "Biologia Centrali-Americani."

THE March number of the *Museums Journal* contains a notice of the collection of Microlepidoptera, with the associated entomological library, recently presented by Lord Walsingham to the Natural History Branch of the British Museum. The collection, which contains about 45,000 species, against some 4000 previously in the museum, has been temporarily deposited in one of the new store-rooms at the base of the building, where it will gradually be arranged in proper order by the additional assistant specially appointed to take charge of it by the trustees.

IN addition to an account of the progress of that institution during the year, the *Aarsberetning* of the Bergen Museum for 1909 contains an illustrated description of the personal relics of Claus Frederik Fastings, which were bequeathed to the museum at his death in 1791. Of the three papers in the third part of the *Aarbog* of the same museum, by far the longest is one, by Mr. O. J. Lie-Pettersen, on the fresh-water rotifer-fauna of Norway. The author has been collecting material for several years, and records a long list of species; but, although it is stated that previously very little was known on the subject, it is remarkable that not a single one of these is described as new.

THE last number of the Journal of the Marine Biological Association of the United Kingdom (vol. viii., No. 5) contains a good example of the admirable work which is being carried on at the association's Plymouth laboratory. The director of the laboratory, Dr. E. J. Allen, and Mr. E. W. Nelson, have been engaged for some years past in experimenting on the cultivation of diatoms as food to be used in the rearing of various types of marine larvæ. By the use chiefly of modifications of Miquel's methods they have been able to make, by the addition of certain substances to sterilised sea-water, nutrient solutions in which it is possible to produce "persistent cultures" of a single species of diatom, or mixed cultures containing several species. In these cultures the diatoms multiply rapidly, and continue to thrive for long periods, sometimes extending over many months. The larvæ to be reared are placed after hatching in pure sterile sea-water; a sufficient amount of the nutrient solution is added, if necessary, and the water is inoculated with a suitable culture of diatoms; in some cases other unicellular organisms were used. By this means larvæ of Echinus were reared until long past the metamorphosis, being fed in the earlier stages upon the actively growing unicellular organisms, and after the metamorphosis on red seaweed. Larvæ of a sea-cucumber (Cucumaria) and a worm (Pomatoceros) were also successfully reared, and the method promises to be of great value to the experimental embryologist.

THE controversy between Dr. Florentino Ameghino and his critics respecting the alleged human origin of the "burnt earths" of Argentina was commented on in NATURE, vol. lxxxi., p. 534. The last paper then noticed was dated February 17, 1909. Since then, Ameghino has issued four others, up to March 19 of the present year; but it will be well now to await the elaborate memoir which is promised, and in which the evidence of hearths with bones of animals used as food will be set forth. The

strong point about Ameghino's spirited and persistent defence is that he now makes it clear that he has studied thin sections of the earths and of numerous artificially prepared products. It is admitted on all hands that minerals from decomposed lavas abound in the Pampas earths, and thus would occur undestroyed in the products of their partial fusion. This was pointed out in the previous notice in NATURE, and the thoroughness of Ameghino's reply is shown by his references to this notice, and his correction of some of its statements, in his "Examen critique du Mémoire de M. Outes" (*Anales del Mus. Nac. de Buenos Aires*, 1909, p. 459). While Ducloux, and perhaps our own reviewer, seem allowed some saving grace, the work of Outes is said to contain "des hérésies scientifiques tellement colossales que personne ne peut croire qu'il les ait publiées de bonne foi." A paper issued on January 29 (*ibid.*, tomo xx., p. 39) provides a very useful summary, with long quotations, of previous work on these debatable earths down to 1907, and a bibliography of work from 1907 to 1909.

THREE new species of Echeveria from southern Mexico are described and figured by Drs. J. N. Rose and C. A. Purpus in vol. xiii., part ii., of the Contributions from the United States National Herbarium. It is suggested that two, *E. gigantea* and *E. subalpina*, will be found useful in horticulture as bedding plants.

BOTANISTS who are contemplating a summer holiday in the Alps with the view of collecting choice plants will be interested in two articles by Mr. H. S. Thompson, published in the *Gardener's Chronicle* (April 16 and 23), giving an account of the flora of Mont Cenis. Among the plants taken between Susa and the Hospice were *Telephium Imperati, Cytisus supinus, Dianthus neglectus*, and *Saponaria lutea*. Around the small Lac Clair, a wonderfully rich hunting ground, situated at a height of 9000 feet, the author found *Campanula cenisia, Arabis coerulea, Cortusa Matthioli*, and clumps of *Saxifraga biflora*. Altogether Mr. Thompson collected 180 plants growing above an altitude of 8000 feet, besides meeting with a rich flora at lower levels.

A CURIOUS gall on the Indian grass *Ischaemum pilosum* is described by Mr. L. A. Boodle in the *Kew Bulletin* (No. 3). It takes the shape of a cylindrical tube about 15 cm. long, resembling a slender goosequill, which, with a few scale leaves at the base, arises as an erect branch from the creeping rhizome. The gall caused by an insect, *Oligotrophus ischaemi*, is considered to be a greatly elongated internode. Various illustrations are given, including figures of the transverse section of the solid normal and hollow modified stem. Reference is also made in a short note to a method of preparing baobab trees as water reservoirs in the Soudanese province of Kordofan. The trunk is hollowed out to form a cistern about 20 feet deep and 10 feet in diameter; then a shallow basin is prepared round the base of the tree for the collection of water during the rain, from which it is transferred to the hollowed trunk.

THE annual report for 1909 of the Rothamsted Experimental Station is not so adverse as might have been expected considering the heavy rainfall and the low temperatures that prevailed through the summer. The yield and quality of wheat grain was poor, but the yields of barley and mangolds were above the average. A comparative test of nitrate of lime, cyanamide, nitrate of soda, and sulphate of ammonia, together with superphosphate in each case, was initiated with barley as the crop, which has yielded, so far, no practical difference in the results. The important investigations carried on by members of the staff in connection with the effect of partial sterilisation of the soil, the direct assimilation of ammonium salts by plants and the development of the wheat grain have already formed the subject of a reference in these columns.

THE annual report for 1909 of the Woods and Forests Department of South Australia appears in Nos. 4 and 6 of the Agricultural Journal of that colony, and shows that the possibilities of the situation are being realised. It is said that inquiries have been made from America for one million railway sleepers cut from red-gum; the contract could not be taken up, because the supply of red-gum for sleepers is rapidly being used up for Australian railways, but it is of interest as showing that even the United States are having to look about for timber supplies. The expenditure of the Department has been increased from 10,080*l.* to 17,575*l.*; the intention is to encourage in every way the planting of pine, gum, and other trees, even to consider the advisability of offering a bonus sufficient to cover the cost of the necessary attention to the trees for the first four or five years of their existence. Wasteful methods of handling mature timber are still in vogue; we are told that only about one-third of the timber on any given area is properly utilised, the rest being destroyed by axe and fire owing to the unsystematic and wasteful character of the lumbering operations.

THE marked increase of the sensitiveness of an instrument for detecting alternating currents of electricity when the free period of the instrument coincides with the period of the current was pointed out by Prof. M. Wien twenty years ago. The property has since led to the production of several forms of vibration galvanometer, and the theory of the instrument has to some extent been investigated. A more complete examination of the theory, and a comparison of the theory with the actual behaviour of three forms of the galvanometer, are to be found in a paper on the subject by Mr. F. Wenner in the February number of the Bulletin of the Bureau of Standards. A few new hints as to the design of the instruments are also given. In order to avoid giving the instrument a double period the moving system must be symmetrical. In bridge work the resistance of the galvanometer should be very much less than that of the bridge, and the back electromotive force developed in the instrument should be half that impressed on the galvanometer circuit.

THE Jesuit Fathers at Zikawei are to be congratulated on the addition to their observatory of a seismological station. During the months of January and February this year a Weichert pendulum of 1200 kilos. recorded twenty-six shocks. Twelve of these were also noted by an Omori pendulum of 15 kilos. Both instruments record on smoked paper. The difference in the number of records obtained from these two types of instruments is undoubtedly striking, but had there been at Zikawei an apparatus which gave a photographic record of earthquake motion it is probable that the total number of shocks noted would have been more than doubled. During this period at Shide, in the Isle of Wight, photographic recorders of the British Association type noted eighty-one disturbances. An instrument writing on smoked paper at that station, however, only recorded a few of these.

IN the second fascicule of vol. iv. (new series) of the *Annales de l'Observatoire royal de Belgique*, the geophysical results obtained at the observatory during 1908

are tabulated and discussed. The hourly values of the three magnetic elements are given in full with the times and values of the absolute maxima and minima, the differences, and the characters of the curves, morning and evening. Then follow valuable *résumés* in several forms, and lastly is given a series of notes directing special attention to the exceptional disturbances of the year, the curves for which appear amongst a number of excellent curves at the end of this section. Other sections deal with the solar observations—useful for comparison with the variations of the magnets—the soil temperatures at various depths, and the seismological records, making the work a valuable source of information to anyone engaged on geophysical problems. The previous fascicule of the same volume dealt with the material collected in 1907, and the index now published shows the contents of the volumes that have appeared, with interruptions, since 1834. In the preface M. Lecointe, the director, pays a fitting tribute to the conscientious and enthusiastic labours of Captain Louis Niesten, who, after thirty-two years' service, has retired from the observatory staff. Practically all the observations now published were made by M. Somville.

THE Wabash Railroad Company, U.S.A., was one of the pioneers in the use of reinforced concrete, and some of their methods of construction were described in a paper read at the Institution of Civil Engineers on April 19. This company commenced the use of this form of construction for bridges, culverts, subways, and retaining walls in 1902. Not any of these structures have required any repairs since they were built. They are very rigid under loads, and their appearance indicates that they will outlast any other kind of structure, and require no maintenance. Attempts have been made to determine the deflection in reinforced concrete structures due to train loads, but none can be detected under ordinary measurement. The unit stresses allowed are as follows:—for steel in tension, on net section of rod, 18,000 lb. per square inch; for steel, bond on deformed bars, 100 lb. per square inch; for concrete, compression in cross-bending, 800 lb. per square inch; for concrete, direct compression, 600 lb. per square inch; for concrete, shear (diagonal tension) in plain concrete, 30 lb. per square inch; for concrete, shear (diagonal tension) where the web is properly reinforced, 100 lb. per square inch. The concrete used consists of one part of Portland cement, two of sand, and four of stone or gravel. Prof. Talbot's rules were employed for proportioning the concrete and steel. The concrete was put in as a wet mixture, securing a more dense and homogeneous concrete, and imbedding the reinforcement better, thus preventing rusting of the metal.

MR. C. BAKER'S classified list (No. 44, April) of second-hand instruments for sale or hire contains particulars of about 1600 pieces of scientific apparatus. The apparatus includes optical instruments of all kinds, and many other appliances and accessories required for instruction or research.

A SECOND revised edition of an excellent handbook, "Brazil in 1910," by Mr. J. C. Oakenfull, has just been issued by the author, 21 Clifford Terrace, St. Budeaux, Devonport. The work has been brought up to date, and is well illustrated by reproductions of photographs and several maps. There are many statistical details, and an appendix giving information as to salaries and cost of living. The main theme of the writer is that Brazil offers abundant opportunities for the activities of Europeans with capital.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN MAY:—

May 2. 4h. Mercury at greatest elongation (20° 55′ E.).
,, 8h. 32m. to 10h. 57m. Transit of Jupiter's Satellite III. (Ganymede).
4 7. Meteoric shower before sunrise from Halley's comet?
8. 17h. Sun eclipsed, invisible at Greenwich.
9. 11h. 59m. to 14h. 26m. Transit of Jupiter's Satellite III. (Ganymede).
10. oh. Mercury 1° 18′ N. of the Moon.
11. 11h. 52m. Minimum of Algol (β Persei).
14. 8h. 41m. ,, ,, ,,
18. 14h. Halley's comet transits the Sun's disc.
23. Moon eclipsed, partly visible at Greenwich.
14h. 33m. First contact with penumbra.
15h. 47m. ,, ,, shadow.
15h. 57m. Moon sets at Greenwich.

THE TOTAL SOLAR ECLIPSE OF MAY 8, 1910.—This eclipse, which can be observed from Tasmania, is not a very favourable one, because the sun at the critical time is only about 8° above the horizon. Mr. Frank McClean, however, who has made considerable preparations for observing it, is already in Tasmania, and has collected a party of eight observers to help him utilise the numerous instruments he has taken out with him. The point he has settled upon as his observing station is situated in the south-west part of the island, namely, Hixson Point, Bramble Cove, Davey. In a cable to Dr. Lockyer, dated April 19, 11.55 a.m., he states:—"Sunday extensive scrub fire within four feet instrument tent. No damage." While on the occasion of his successful expedition to Flint Island in 1908 his chief enemy was "water," he has now had to combat "fire." Little is known at present about the site, but in a letter to the recipient of the cable he writes that one of his party "is as strong as a horse," and will be exceedingly useful "when we have to clear the 200-feet high trees out of the way and carry the packing cases up a 600-feet hill." It will thus be seen that he is making every endeavour to secure as good a site as possible, and it is hoped that his energy will be rewarded with success.

HALLEY'S COMET.—Reports from a number of places state that Halley's comet has been seen as a fairly bright object, under favourable conditions, with the naked eye. Cloudy weather has seriously interfered with English observers, but the comet was seen, and estimated to be of the second magnitude, at Greenwich on the morning of April 25, and was followed until nearly sunrise. According to the *Times* report, it was probably seen with the naked eye, and photographs were secured with several instruments. Owing to the brightness of the sky, exposures of one minute only were possible, and the resulting plates show only the nucleus and coma, with no reference stars. The appearance of the comet was that of a small whitish cloud with a brighter nucleus. The *Times* also states that good positions of the comet were secured by Dr. Ristenpart, at Santiago, on April 12, 15, and 21, and that he has re-determined the time of perihelion passage as April 19·6803 (G.M.T.), about an hour later than was determined by Mr. Merfield. Observations by Mr. Ryves at Saragossa, Spain, on April 21, showed, from naked-eye comparisons with γ Pegasi, that the magnitude was about 2·7. Mr. Innes also reports a naked-eye observation at Lyme Regis on April 25, between 4h. and 4h. 30m. a.m. Similar observations are reported from Malta and Gibraltar, and, at the former, a tail about 1° in length, and inclined about 40° to the horizon, was seen.

In No. 16 of the *Comptes rendus* (p. 955, April 18) M. Giacobini reports having observed the comet, at the Paris Observatory, between 16h. and 18h. on April 17. He was surprised at the increase in brightness since March 7, when the magnitude was estimated as 9·5; at present he estimates it as 2·0 or 2·5. Taking the ephemeris values for the distances from the sun and earth, this means that on May 18, 19, and 20 the magnitude should be −1·3 to −1·8, as bright as, or brighter than, Sirius. To M. Giacobini the comet appeared as a circular nebulosity 30″ to 35″ in diameter, with a strong central con-